

## Claims

[c1] What is claimed is:

1.A power control method for controlling a laser power used by an optical disk drive to record data on an optical disk, the power control method comprising: driving a pick-up head of the optical disk drive to sequentially output a plurality of first test laser powers according to a plurality of first control signals; and establishing a first mapping function according to the first control signals and the first test laser powers; wherein a first predetermined laser power and a first predetermined control signal is obtained by using the first mapping function, and the first predetermined control signal is used for driving the pick-up head to output the first predetermined laser power.

[c2] 2.The power control method of claim 1 wherein a closed loop configuration is established when the pick-up head is driven to output the first test laser powers.

[c3] 3.The power control method of claim 1 wherein the first predetermined laser power is substantially a write power used by a CD-R drive for etching a recording layer of an optical disk.

- [c4] 4.The power control method of claim 1 wherein the first predetermined laser power is substantially an erase power used by a CD-RW drive for erasing data recorded on a recording layer of an optical disk.
- [c5] 5.The power control method of claim 1 further comprising:
  - driving the pick-up head to output a plurality of second test laser powers according to a plurality of second control signals;
  - measuring the second test laser powers; and
  - establishing a second mapping function by using the second control signals and the second test laser powers.
- [c6] 6.The power control method of claim 5 wherein an open loop configuration is established when the pick-up head outputs the second test laser powers according to said second control signals.
- [c7] 7.The power control method of claim 1 further comprising a step of adjusting an amplifying gain adaptive to a current status of the pick-up head according to the first test powers.
- [c8] 8.The power control method of claim 7 further comprising:
  - using the second mapping function for determining a

plurality of third control signals and a plurality of third test laser powers corresponding to the third control signals;

adjusting the amplifying gain to output a plurality of fourth control signals;

using the third and fourth control signals for driving the pick-up head to output a plurality of fourth test laser powers; and

using the third control signals and corresponding amplifying gains for establishing a third mapping function; wherein each of the fourth test laser powers is proportional to a corresponding third test laser power according to a predetermined ratio.

[c9] 9. The power control method of claim 8 wherein the third test laser powers substantially indicates erase powers of a CD-RW drive, corresponding to the third control signals, and the fourth test laser powers substantially indicates write powers of the CD-RW drive corresponding to the third control signals.

[c10] 10. The power control method of claim 8 wherein an open loop configuration is established when adjusting the amplifying gain.

[c11] 11. A power control method for controlling a laser power used by an optical disk drive to record data on an optical

disk, the power control method comprising:

deriving and measuring a plurality of first test laser powers;

establishing a first mapping function according to first control signals and the first test laser powers;

determining a plurality of third control signals and a plurality of corresponding third test laser powers according to the first mapping function;

adjusting an amplifying gain adaptive to a current status of the pick-up head to so as output a plurality of fourth control voltages;

using the third control voltages and the fourth control voltages for driving the pick-up head to output a plurality of fourth test laser powers; and

using the third control signals and the corresponding amplifying gains to establish a second mapping function; wherein each of the fourth test laser powers is proportional to a corresponding third test laser power according to a predetermined ratio.

[c12] 12. The power control method of claim 11 wherein the third test laser powers substantially indicates erase powers of a CD-RW drive corresponding to the third control signals, and the fourth test laser powers substantially indicates write powers of the CD-RW drive corresponding to the third control signals.

[c13] 13. The power control method of claim 11 further comprising:

deriving a plurality of fifth control voltages to drive the pick-up head to output a plurality of fifth test laser powers;

using the pick-up head for measuring the fifth test laser powers; and

using the fifth control signals and the fifth test laser powers for establishing a fifth mapping function; wherein the optical disk drive uses the fifth mapping function for calculating a first predetermined laser power and a first predetermined control signal, and the first predetermined power is an erase power corresponding to the first predetermined control signal.

[c14] 14. The power control method of claim 11 wherein a close loop configuration is established when deriving the fifth control voltages.